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Becker in Leipzig, Dr. Fränkel in Berlin, and Dr. Frank in Naples. These are all members of the younger generation of instructors, and are adepts in the laboratory methods of Koch. Dr. Fischer's original work has been exerted in two directions chiefly, — one in the application of bromine to disinfection, another in the study of the phosphorescence of the sea.

#### ELECTRICAL NEWS.

**NEW FORM OF GAS-BATTERY.**—This battery, invented by Mr. Ludwig Mond and Dr. Carl Langer, is an improvement on the gas-battery invented by Grove fifty years ago, which produces electricity from hydrogen and oxygen gas by the intervention of platinum. The distinguishing feature of the new battery, which has been designed to obtain large currents of electricity by means of these gases, is, according to *Nature*, that the electrolyte is not employed as a mobile liquid, but in a quasi-solid form, and it is therefore named "dry gas battery." Each element of the battery consists of a porous diaphragm of a non-conducting material,—for instance, plaster-of-Paris,—which is impregnated with dilute sulphuric acid. Both sides of this diaphragm are covered with very fine platinum-leaf, perforated with very numerous small holes, and over this with a thin film of platinum black. Both these coatings are in contact with frameworks of lead and antimony, insulated one from the other, which conduct the electricity to the poles of each element. A number of these elements are placed side by side, or one above the other, with non-conducting frames intervening, so as to form chambers through which hydrogen-gas is passed along one side of the element, and air along the other. One element, with a total effective surface of 774 square centimetres (120 square inches), which is covered by 1 gram of platinum black and .35 of a gram of platinum-leaf, shows an electro-motive force of very nearly 1 volt when open, and produces a current of 2 amperes and .7 of a volt, or 1.4 watts, when the outer resistance is properly adjusted. This current is equal to nearly 50 per cent of the total energy obtainable from the hydrogen absorbed in the battery. The electro-motive force decreases, however, slowly, in consequence of the transport of the sulphuric acid from one side of the diaphragm to the other. In order to counteract this disturbing influence, the gases are from time to time interchanged. The battery works equally well with gases containing 30 to 40 per cent of hydrogen, such as can be obtained by the action of steam, or steam and air, on coal or coke, if the gases have been sufficiently purified from carbonic oxide and hydrocarbons. The water produced in the battery by the combination of hydrogen and oxygen is carried off by the unconsumed nitrogen, and an excess of air carried through it for this purpose.

#### BOOK-REVIEWS.

*Education in the United States: its History from the Earliest Settlements.* (International Education Series.) By RICHARD G. BOONE. New York, Appleton. 12°. \$1.50.

THIS book belongs to a class that are becoming rather common in this country, books presenting a large amount of useful information in an unattractive style. The time has been when a good literary style was considered indispensable in an historical work; but in our time, and especially in this country, we are treated to volume after volume on historical themes in which style is utterly lacking. That this should be so is somewhat surprising; for a work that has no charm of style is certain to have a much smaller circle of readers than one that has that attraction, and writers usually desire as many readers as possible. In Mr. Boone's book we are sorry to find this literary defect; for the work has a good deal of merit of other kinds, conveying as it does a large amount of information for the most part well arranged. It has evidently been prepared by careful and conscientious study of the original authorities, and will be useful at least to all educators and as a work of reference to all intelligent readers. It opens with an account of the steps taken by the early colonists to establish schools and colleges, and shows how, at the very outset of our national history, the sentiments of North and South differed on this subject

of education. Massachusetts and Connecticut led the way in founding schools for the whole people, and it was not until comparatively recent times that their ideas and practice became generally prevalent. How the public-school system grew up and overspread the country, Mr. Boone relates at considerable length; and he does not fail to show how much the schools have been improved by the increase of State control. Then follows a chapter on recent progress in the colleges, showing the changes in the curriculum, the introduction of the elective system, and other matters of interest. Professional and technological schools are also treated of, and there is a chapter on the education of the deaf and dumb and other unfortunates, and of criminals. The author does not confine himself, however, to the schools alone, but gives the history of other educational agencies, such as libraries, museums, and learned societies. The founding of the Smithsonian Institution, the grants of land for educational purposes, and other acts of the general government bearing on education, are related; and the book closes with an interesting chapter on the advance that has been made in the education of women. Thus it contains a valuable mass of information, which, so far as we know, was not accessible before in a convenient form.

*A Theoretical and Practical Treatise on the Strength of Beams and Girders.* By ROBERT H. COUSINS. New York, Spon. 12°. \$5.

SINCE the time of Galileo, the subject of which this volume treats has received much attention at the hands of the ablest mathematicians of all countries. Many attempts have been made during the present century to solve experimentally the problems involved, only to result in the adoption, by many experimenters, of empirical rules for the strength of beams and girders, rather than scientifically deduced formulas; the reason for this, as given by one authority, being that "no theory of the rupture of a simple beam has yet been proposed which fully satisfies the critical experimenter." The theory advanced in this treatise, and the formulas resulting from that theory, deduce the strength of beams and girders from the direct crushing and tensile strength of the material composing them, leaving out of the problem altogether the co-efficient known as the modulus of rupture. The theory and the formulas deduced from it are in accord with correct mechanical and mathematical principles, and the author believes that they will fully satisfy the results obtained by the experimenter. Works of this character derive special importance from the constantly increasing use of iron and steel for building and engineering purposes.

*The Beginners' Book in German.* By SOPHIE DORJOT. Boston, Ginn. 12°. 90 cents.

THIS little book is the result of the need felt by the author and others, in teaching German, of suitable books to put into the hands of beginners. It consists of two parts. Part I. is a series of lessons, each of which is introduced with a picture, followed by corresponding verses from the child-literature of Germany. These pictures, which illustrate the text following, were all drawn expressly for the purpose, and are brimming with the spirit of fun and humor which they have so faithfully caught from the child-lore. A conversation upon the subject, with the study of words and phrases, completes each lesson. In this way advantage is taken of the children's tastes and inclinations, and even of the mischievous element which enters so largely into the child-nature. The second part contains graded selections for reading.

The typography and make-up are in every way excellent. The book, as a whole, forms a very attractive volume, and we have no doubt that it will prove, as the author has intended, a great relief to teachers and a source of pleasure to pupils.

*The A B C of Electricity.* By WILLIAM H. MEADOWCROFT. New York, F. W. Lovell. 12°. 50 cents.

CONDENSATION of matter and simplicity of language are the points most noticeable in this little volume. A brief general outline of the rudiments of electrical science, or at least of those departments of it which have now become almost a part of every-day life, is given in language devoid of those technicalities which are

so puzzling and discouraging to the general public, though necessary to the student and the electrician. The author does not put it forward as a scientific work, of which there is no lack, intending it only as a sort of guide-book on the road to electrical science, which will probably give to many the information they may desire, without requiring too great a research into works which treat more extensively and deeply of the subject. The book bears the indorsement of Thomas A. Edison.

#### AMONG THE PUBLISHERS.

AMONG the timely articles in the July number of *The New Review*, which Longmans, Green, & Co. expect to have ready about the 12th, are "The Eiffel Tower," by M. Eiffel himself; "The Shah of Persia," by Lord Castletown; and "The Eight Hours Bill," by Mr. Charles Bradlaugh. There will also be an anonymous article on "The Talkers of London." Matthew Arnold's literary executor, Lord Coleridge, has written a paper on the lamented poet and critic, which will appear in the July number of *The New Review*.

— The July number of *Blackwood's* will contain a story by Mr. Oscar Wilde on the subject of Shakspeare's sonnets. Mr. Wilde will put forward an entirely new theory as to the identity of the mysterious "Mr. W. H." of the famous preface.

— John Wiley & Sons have just ready a work on "Steam-Engine Design," for the use of mechanical engineers, students, and draughtsmen, by Professor J. M. Witham.

— Ticknor & Co. announce "The Moral Idea: a Historic Study," by Julia Wedgwood, — a work which is said to be the outcome of twenty years of study, and which is described as "a history of human aspiration after a moral ideal that changes continually in the evolution of time and thought, the highest truth discovered by one age being often found by a revolt against the errors circling round the belief that was the life of a former age."

— D. Appleton & Co. have ready "Days Out of Doors," by Charles C. Abbott, a companion volume to his "A Naturalist's Rambles about Home;" "The Garden's Story," by George H. Ellwanger, relating the pleasures and trials of an amateur gardener, illustrated with head and tail pieces by Rhead; and "The History of a Slave," by H. M. Johnston, author of the "Kilimanjaro Expedition."

— In the July issues of the leading English reviews, Mr. Gladstone contributes to the *Nineteenth Century* an article entitled "Plain Speaking on the Irish Union." Mr. Gosse writes on "Edward FitzGerald," the translator of Omar Khayyūm, in the *Fortnightly*; and Walter Besant describes the first society of British authors (1843) in the *Contemporary Review*. This last-named periodical will contain, in addition to other notable articles, a paper on "Jewels and Dress," by Mrs. Haweis; and one on "Thomas Hardy," by J. M. Barrie.

— Messrs. Belford, Clarke, & Co. send us two of their lately published novels, — "The Prophet's Mantle," by Fabian Bland; and "Trean, or The Mormon's Daughter," by Alva M. Kerr. The former is much better than many recent novels, being not only unexceptionable in both a moral and a literary sense, but really an entertaining story. The leading character is a Russian nihilist, but the scene is mostly laid in London. The incidents are mostly of an ordinary kind, only a few being unusually exciting; yet the interest is unflagging from beginning to end. A good deal is said by the various characters on the subjects of socialism, capitalism, tyranny, and the urgent need of social re-organization, and the author seems to be more or less in sympathy with socialistic views, but with some doubts about their practicability. The other novel is inferior to "The Prophet's Mantle," but has nevertheless an interest of its own. The hero of the tale is an eastern man, who goes on business to Utah, and there falls in love with a Mormon's daughter. A Mormon bishop, however, who already had several wives, was bent on adding that same girl to the list; and hence arose a host of trouble for the young lovers, out of which, of course, they at last emerged triumphant. The book contains a great deal about the Mormon doctrines and practices — most readers will

think too much for the interest of the story; and the author is evidently a determined hater of the whole Mormon system. Almost every novel nowadays endeavors, as these do, to deal with some moral or social question, either by showing in a vivid light some evil that requires a remedy or by rousing a public sentiment in favor of reform. This tendency, if properly directed, is certainly to be welcomed; for it makes the story not only more useful and improving, but also to men of intelligence more interesting.

— Messrs. Ginn & Co. announce for early publication "Pages Choies des Mémoires du Duc de Saint-Simon," edited for use in colleges and advanced classes, and for private readers, by Alphonse N. Van Daell, Ph.C., LL.D., recently director of modern languages in the Boston High and Latin Schools, and now professor of French in the Massachusetts Institute of Technology. The "Mémoires of Saint-Simon," which are of great importance for both the literary and the historical study of the seventeenth century in France, are accessible to but few students, partly on account of their bulk. The editor does not know of any American edition, although it is very desirable to have Saint-Simon's prose studied in an advanced course. The notes will be in French; and the introduction will consist of two selections, — one from Taine, the other from Rambaud. The same firm also announce for publication in August, Dumas' "Les Trois Mousquetaires," edited by Professor F. C. Sumichrast of Harvard University, for use in schools and colleges and for private readers. Alexandre Dumas was one of the brightest and most entertaining of writers; but his works, with the exception of "La Tulipe Noire," have not been available for college or school work on account of their length and the frequent occurrence of objectionable passages. These two objections are removed in this edition of Dumas' masterpiece, "Les Trois Mousquetaires." The story itself is kept intact, and the brilliant description of court, camp, and city life preserved; but the "padding" has been omitted, and its place supplied by brief summaries. Every objectionable page has been carefully excised, and this with the greater readiness that the actual story is not thereby affected. The book will form a volume of about two hundred pages of reading-matter, and, being fully annotated, will prove an edition serviceable to student and teacher alike.

— The *Forum* for July contains eleven articles on a great variety of subjects and of varying excellence. The most important is the opening one, by Bishop Henry C. Potter, on "The Scholar in American Life." The writer justly thinks that the American people are greatly in need of a much higher grade of scholarship than now prevails among them; and in this essay he endeavors to show this need, and also to point out the conditions on which alone it can be supplied. By scholarship Bishop Potter does not mean the mere possession of knowledge: on the contrary, he speaks slightly of those who merely retail other men's ideas. It is the original thinker, the teacher of new truths, whom he designates as the scholar, and whose work he regards as so important. At present such men are rare in this country, and those of the highest class are not found here at all; and Bishop Potter doubts if we shall have them in any considerable numbers until our universities provide, either by fellowships or by lectureships, for their support. The whole paper is well considered, and ought to be read and pondered by all who have the interests of American civilization at heart. Mr. W. S. Lilly continues his series of papers on what he deems the moral looseness of the present age, treating this time of "The Ethics of Journalism." He contrasts the ideal of the journalist's profession with the reality, and it cannot be denied that the charges he brings against the common run of journalists have a solid basis of fact. Professor G. J. Romanes replies briefly to Mr. Mivart's criticism of the Darwinian theory, but without saying anything that is new. Dr. Austin Flint has a paper on "Late Theories concerning Fever," in which he considers especially the mode of treating that disease. He remarks that the increase of temperature is the really dangerous element in the case, and, while he speaks somewhat hesitatingly about the use of drugs for reducing the temperature, recommends in strong terms the application of cool baths. M. Honoré Beaugrand writes of "The Attitude of the French Canadians" on the questions of commercial union and annexation to the United States. He replies to Professor Goldwin